

## AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions and listings of claims in the application:

1. (Currently Amended) A ~~dielectric layer~~ barrier structure, comprising:  
a densified amorphous dielectric layer deposited on a substrate by pulsed-DC, substrate biased physical vapor deposition,  
~~a soft metal at the interface between the densified amorphous dielectric layer and the substrate, wherein the strain between the densified amorphous dielectric layer and the substrate is reduced by the soft metal, and~~  
wherein the densified amorphous dielectric layer is a barrier layer, and  
wherein a water vapor transmission rate through the barrier layer is less than about  $1 \times 10^{-2}$  gm/m<sup>2</sup>/day when the barrier layer has a thickness of about 1.5 KÅ.
2. (Cancelled).
3. (Previously presented) The structure of claim 1, wherein the barrier layer is also an optical layer.
4. (Previously presented) The structure of claim 1, wherein the barrier layer includes a TiO<sub>2</sub> layer.
5. (Previously presented) The structure of claim 1, wherein the barrier layer includes an Alumina/Silica layer.
6. (Withdrawn) The structure of claim 3, further including a soft-metal breath treatment.
7. (Withdrawn) The structure of claim 6, wherein the soft-metal breath treatment is an indium-tin vapor treatment.

8. (Withdrawn) The structure of claim 1, wherein the barrier layer is also an electrical layer.
9. (Withdrawn) The structure of claim 8, wherein the barrier layer includes a capacitive layer.
10. (Withdrawn) The structure of claim 9, wherein the capacitive layer is a  $\text{TiO}_2$  layer.
11. (Withdrawn) The structure of claim 9, wherein the capacitive layer is an Alumina/silica layer.
12. (Withdrawn) The structure of claim 8, wherein the barrier layer includes a resistive layer.
13. (Withdrawn) The structure of claim 12, wherein the resistive layer is indium-tin metal or oxide.
14. (Withdrawn) The structure of claim 8, further including a soft-metal breath treatment.
15. (Withdrawn) The structure of claim 14, wherein the soft-metal breath treatment is an indium-tin vapor treatment.
16. (Withdrawn) The structure of claim 1, wherein the barrier layer includes a tribological layer.
17. (Withdrawn) The structure of claim 16, wherein the tribological layer is a  $\text{TiO}_2$  layer.
18. (Withdrawn) The structure of claim 16, wherein the tribological layer is Alumina/silica.

19. (Withdrawn) The structure of claim 16, further including a soft-metal breath treatment.
20. (Withdrawn) The structure of claim 19, wherein the soft-metal breath treatment is an indium-tin vapor treatment.
21. (Withdrawn) The structure of claim 1, wherein the barrier layer is a biologically immune compatible layer.
22. (Withdrawn) The structure of claim 1, wherein the biologically immune compatible layer is  $\text{TiO}_2$ .
23. (Withdrawn) The structure of claim 21, further including a soft-metal breath treatment.
24. (Withdrawn) The structure of claim 23 wherein the soft-metal breath treatment is an indium-tin vapor treatment.
25. (Currently amended) The structure of claim 1, wherein the ~~dielectric film~~ barrier layer is  $\text{TiO}_2$ .
26. (Currently amended) The structure of claim 1, wherein a target utilized to form the ~~dielectric film~~ barrier layer has a concentration of 92% Al and 8% Si.
27. (Currently amended) The structure of claim 1, wherein a target utilized to form the ~~dielectric film~~ barrier layer is formed from metallic magnesium.
28. (Currently amended) The structure of claim 1, wherein a target material utilized to form the ~~dielectric film~~ barrier layer comprises materials chosen from a group consisting of Mg, Ta, Ti, Al, Y, Zr, Si, Hf, Ba, Sr, Nb, and combinations thereof.
29. (Previously presented) The structure of claim 28, wherein the target material includes a concentration of rare earth metal.

30. (Currently amended) The structure of claim 1, wherein a target material utilized to form the ~~dielectric film~~ barrier layer comprises a sub-oxide of a group consisting of Mg, Ta, Ti, Al, Y, Zr, Si, Hf, Ba, Sr, Nb, and combinations thereof.
31. (Withdrawn) The structure of claim 1, further including a soft-metal breath treatment.
32. (Withdrawn) The structure of claim 31, wherein the soft-metal breath treatment is an indium-tin vapor treatment.
33. (Withdrawn) The structure of claim 1, wherein the dielectric film has a permeable defect concentration of less than about 1 per square centimeter.
34. (Cancelled)
35. (Previously presented) The structure of claim 1, wherein an optical attenuation through the barrier layer is less than about 0.1 dB/cm in a continuous film.
36. (Previously presented) The structure of claim 1, wherein the barrier layer has a thickness less than about 500 nm.
37. (Previously presented) The structure of claim 36, wherein the water vapor transmission rate is less than about  $1 \times 10^{-2}$  gm/m<sup>2</sup>/day.
38. (Previously presented) The structure of claim 1, wherein a thickness of the barrier layer is less than about 1 micron and a water vapor transmission rate through the barrier layer is less than about  $1 \times 10^{-2}$  gm/m<sup>2</sup>/day.
39. (Withdrawn) The structure of claim 1, wherein the barrier layer operates as a gate oxide for a thin film transistor.
40. (Withdrawn) A method of forming a barrier layer, comprising:  
providing a substrate;

depositing a highly densified, amorphous, dielectric material over the substrate in a pulsed-DC, biased, wide target physical vapor deposition process.

41. (Withdrawn) The method of claim 40, further including performing a soft-metal breath treatment on the substrate.
42. (Withdrawn) The method of claim 40, wherein the dielectric material is formed from a target comprising 92% Al and 8% Si.
43. (Withdrawn) The method of claim 40, wherein the dielectric material is formed from a target comprising of Titanium.
44. (Withdrawn) The method of claim 40, wherein the dielectric material is formed from a target material comprising materials chosen from a group consisting of Mg, Ta, Ti, Al, Y, Zr, Si, Hf, Ba, Sr, Nb, and combinations thereof.
45. (Withdrawn) The method of claim 41, wherein the soft-metal breath treatment is an indium/tin breath treatment.
46. (Canceled)
47. (Previously presented) The dielectric layer of claim 1, wherein the barrier layer is an electrical layer.
48. (Canceled)
49. (Currently Amended) The structure of claim-481, wherein the barrier layer is also an optical layer.
50. (Currently Amended) The structure of claim-481, wherein the barrier layer includes a TiO<sub>2</sub> layer.
51. (Currently Amended) The structure of claim-481, wherein the barrier layer includes an Alumina/Silica layer.

52. (Currently Amended) The structure of claim-481, wherein an optical attenuation through the barrier layer is less than about 0.1 dB/cm in a continuous film.

53. (Currently Amended) The structure of claim-481, wherein the barrier layer has a thickness less than about 500 nm.

54. (Withdrawn, currently amended) The structure of claim-481, further including a soft-metal at the interface between the barrier layer and the substrate.